NKDEP

National Kidney Disease
Education Program

Rationale for Use and Reporting of Estimated GFR

Use of an estimating or prediction equation to estimate glomerular filtration rate (GFR) from serum creatinine is useful and should be employed for people with chronic kidney disease (CKD) and those at risk for CKD (diabetes, hypertension, and family history of kidney failure). This is a recommendation of the National Kidney Disease Education Program (NKDEP) of the NIH and the Kidney Disease Outcomes Quality Initiative (KDOQI) of the National Kidney Foundation, and is the method referenced for definition of CKD in the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC 7) of the NIH. All recommend the MDRD equation for adults. NKDEP and KDOQI advocate routine reporting by laboratories of GFR estimates with serum creatinine. Indeed, several health systems have begun this practice.

The primary reasons for these recommendations are:

- **GFR and creatinine clearance are poorly inferred from the serum creatinine alone.** This is mainly because these are related inversely (non-linearly) to serum creatinine and the effects of age and sex, and to a lesser extent race, on creatinine production further cloud interpretation.

- **Creatinine is more often measured than urinary albumin in practice.** At present, adherence to guidelines for annual urinary albumin testing in diabetes is poor. Serum creatinine is more often measured than urinary albumin and if a depressed GFR is noted, the provider must confront CKD even if at a later stage than microalbuminuria.

- **Measurement of kidney function (GFR or creatinine clearance) is essential once albuminuria is discovered.**

- **The MDRD equation is the most thoroughly validated equation.** Further validation is under way in more groups, for example in people with normal GFR or diabetes and Hispanics.

- **The equation is superior to other methods of approximating GFR.** Direct comparison of the MDRD equation to other equations such as Cockcroft–Gault and even 24-hour urine collections have proven this superiority.

- **Nephrology specialists routinely use an estimating equation now.** The routine lab limits of normal for serum creatinine are so crude that specialists either explicitly apply an equation or, based on experience, estimate GFR. Primary care providers and other specialists should have that advantage.

- **The MDRD equation does not require weight as a variable.** The equation yields a GFR normalized to 1.73 m^2 body surface area. It is true that most laboratory information systems do not include race. The result should be reported as X if non-African American and Y if African American. The user, patient or provider can decide which is appropriate. The difference between races is not large anyway, about 20%.

A calculator is available at www.nkdep.nih.gov. However, routine reporting of estimated GFR along with serum creatinine is highly desirable.

As the NKDEP Laboratory Working Group establishes better reference materials for the creatinine and the trueness of the assay in the lower range improves, routine reporting of values for children, using an appropriate estimating equation, is anticipated.

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